

THIONIN Lauth's Violet							
Aldrich Cat. No.	86,134-0						
Sigma Prod. No.	T3387						
Grade	Certified						
CAS No.	[78338-22-4]						
C.I. No.	52000						
Mol. Form.	$C_{14}H_{13}N_3O_2S$						
F.W.	287.34						
Appearance λ_{max}	Very dark-green powder 598nm in water						
Solubility	<table> <tr> <td>H₂O</td><td>30mg/ml</td></tr> <tr> <td>EGME</td><td>4mg/ml</td></tr> <tr> <td>EtOH</td><td>3mg/ml</td></tr> </table>	H ₂ O	30mg/ml	EGME	4mg/ml	EtOH	3mg/ml
H ₂ O	30mg/ml						
EGME	4mg/ml						
EtOH	3mg/ml						

FIG. 1

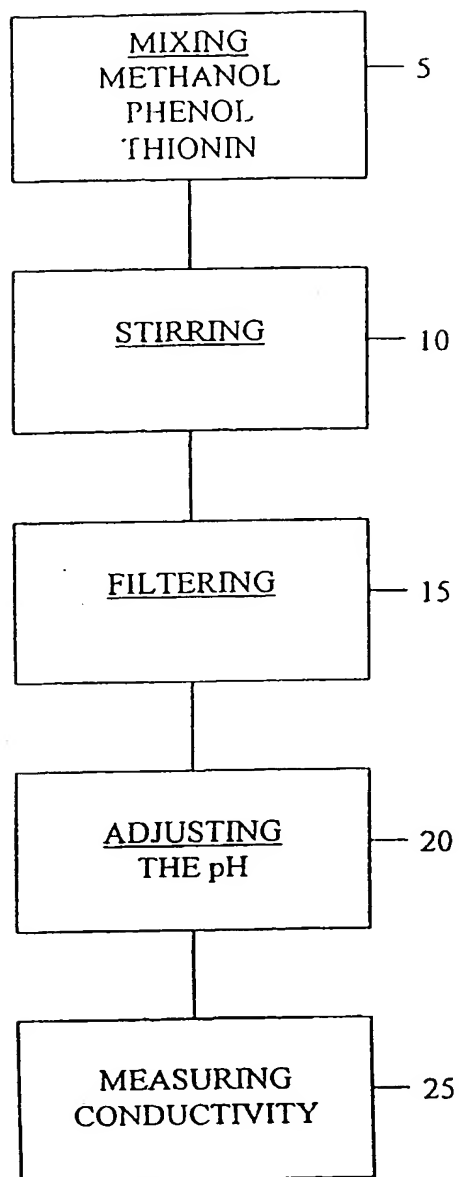


FIG. 2

EOSIN Y Acid Red 87			
Aldrich Cat. No.	11,983-0		21,612-7
Sigma Prod. No.	E4382		—
Grade	Certified		Indicator
Dye content	~90%		~80%
CAS No.	[548-26-5]		
C.I. No.	45380		
Mol. Form.	$C_{20}H_6Br_4Na_2O_3$		
F.W.	691.88		
Appearance λ_{max}	Rust powder 514nm in water + 1ml 1% sodium carbonate		Dark red-brown powder 517nm in water + 1ml 1% sodium carbonate
Solubility	H ₂ O 40mg/ml EGME 40mg/ml EtOH 10mg./ml		200mg/ml 50mg/ml 20mg/ml

FIG. 3

LIGHT GREEN SF YELLOWISH Acid Green 5	
Aldrich Cat. No.	86,120-0
Sigma Prod. No.	L1886
Grade	Certified
CAS No.	[5141-20-8]
C.I. No.	42095
Mol. Form.	$C_{37}H_{34}N_2Na_2O_9S_3$
F.W.	792.86
m.p.	288°C (dec.)
Appearance	Deep-purple powder
λ_{max}	630(422)nm in water
Solubility	H ₂ O 100mg/ml
	EGME 100mg/ml
	EtOH 2mg/ml

FIG. 4

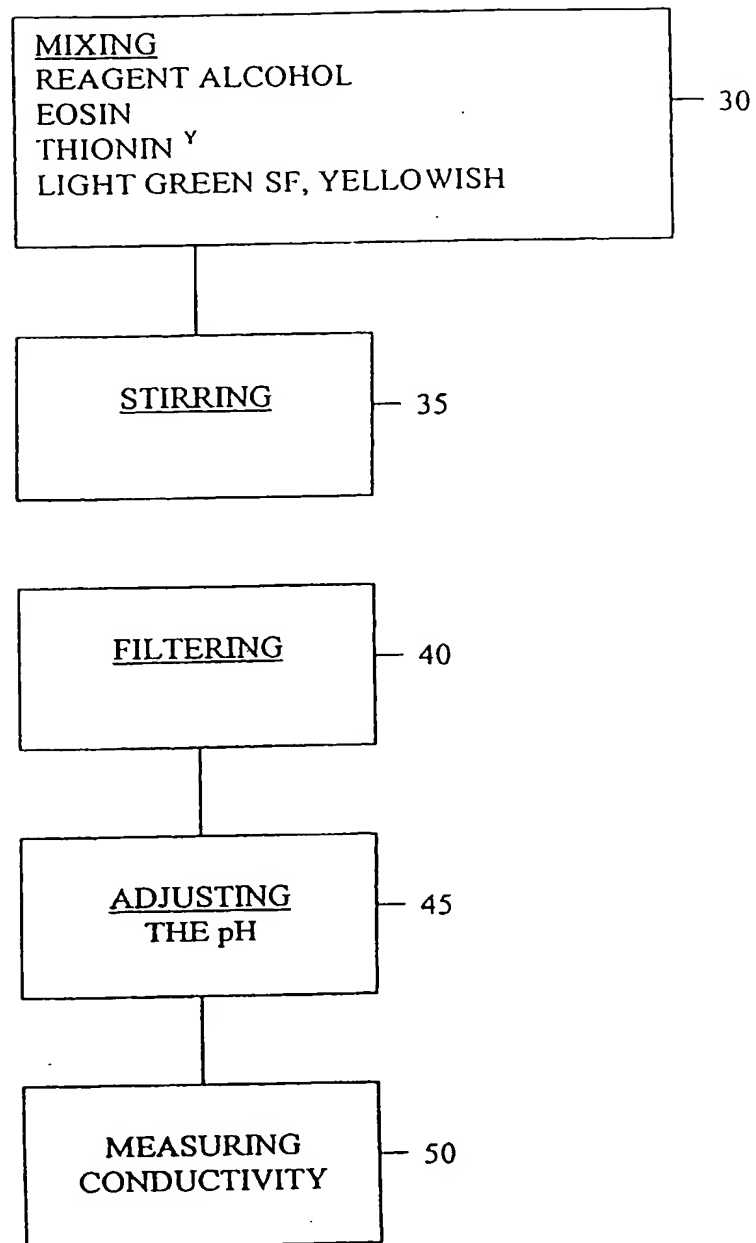


FIG. 5

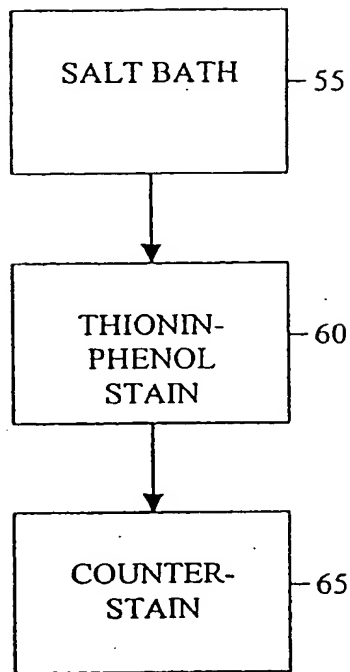


FIG. 6

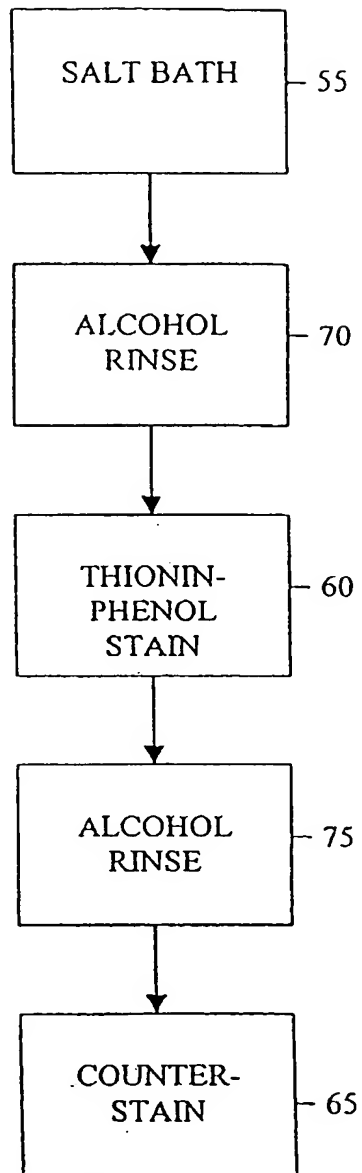


FIG. 7

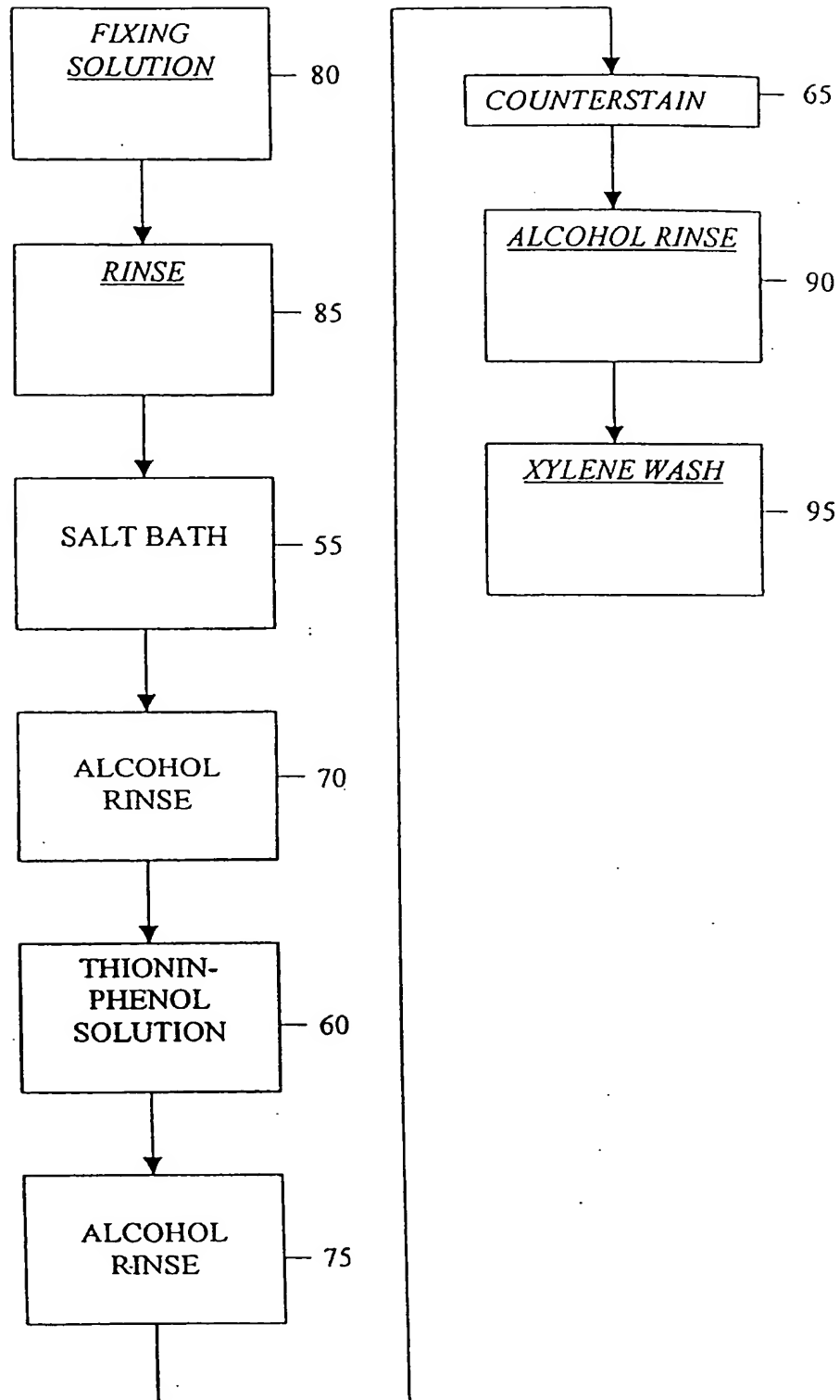


FIG. 8

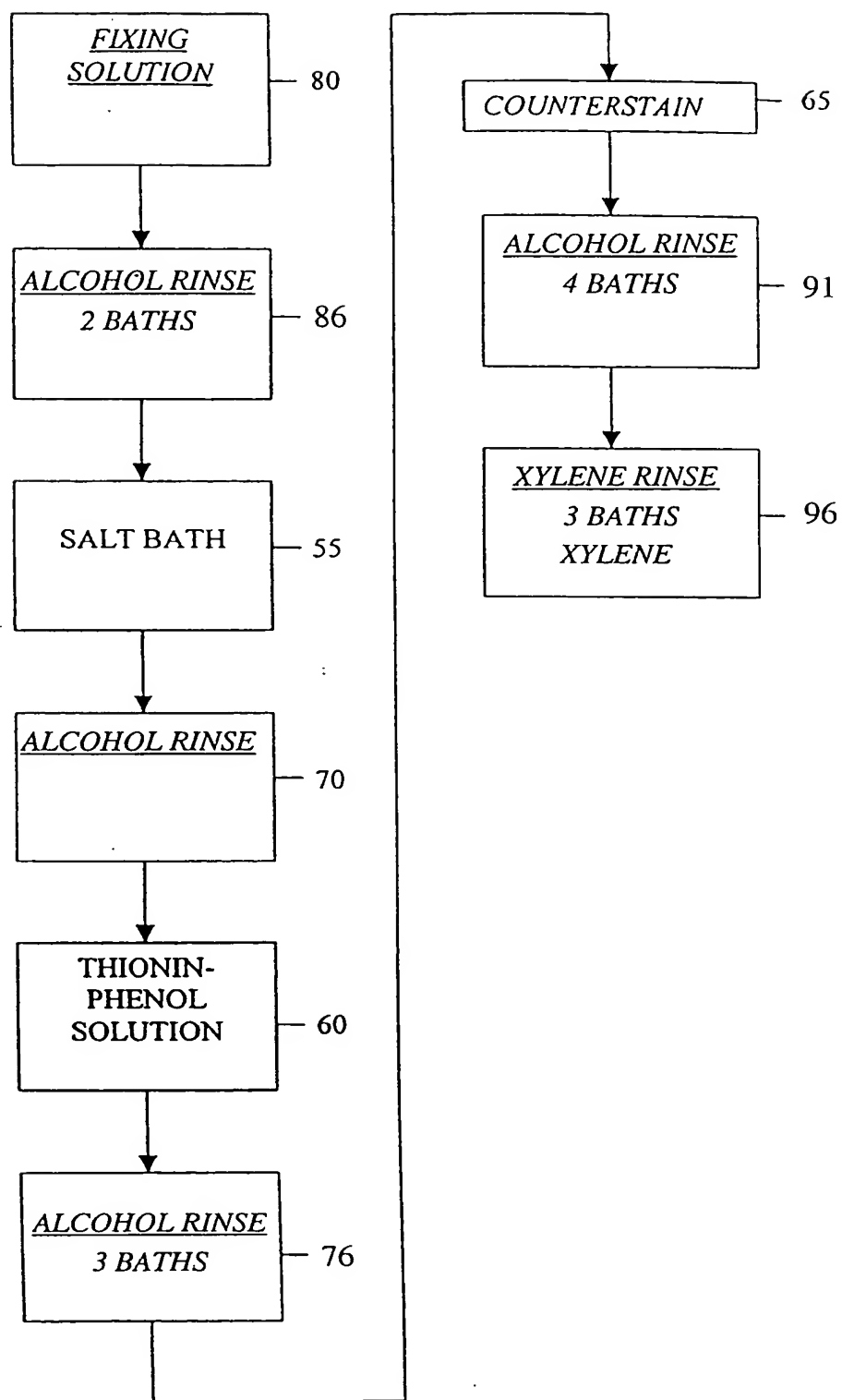


FIG. 9

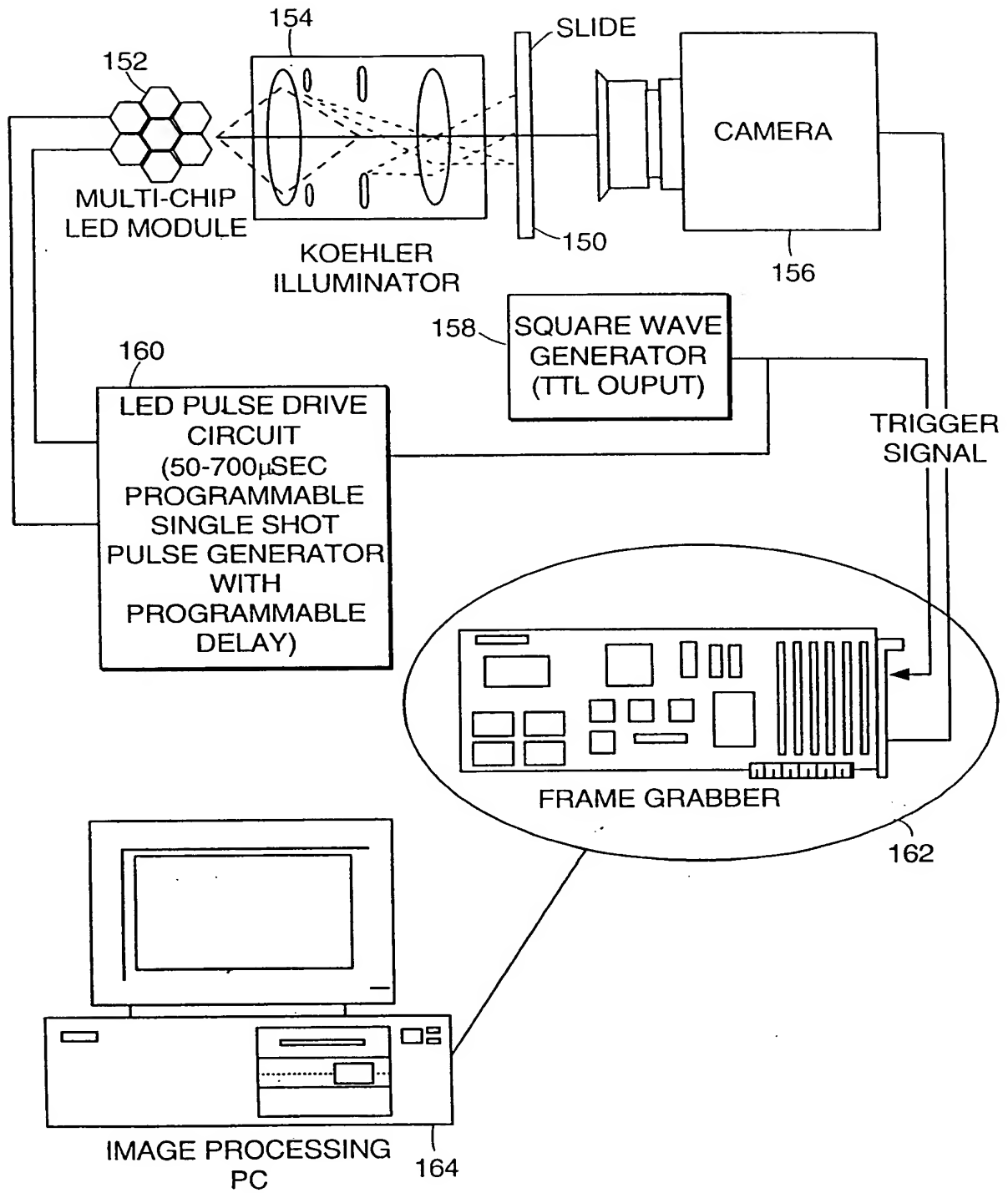
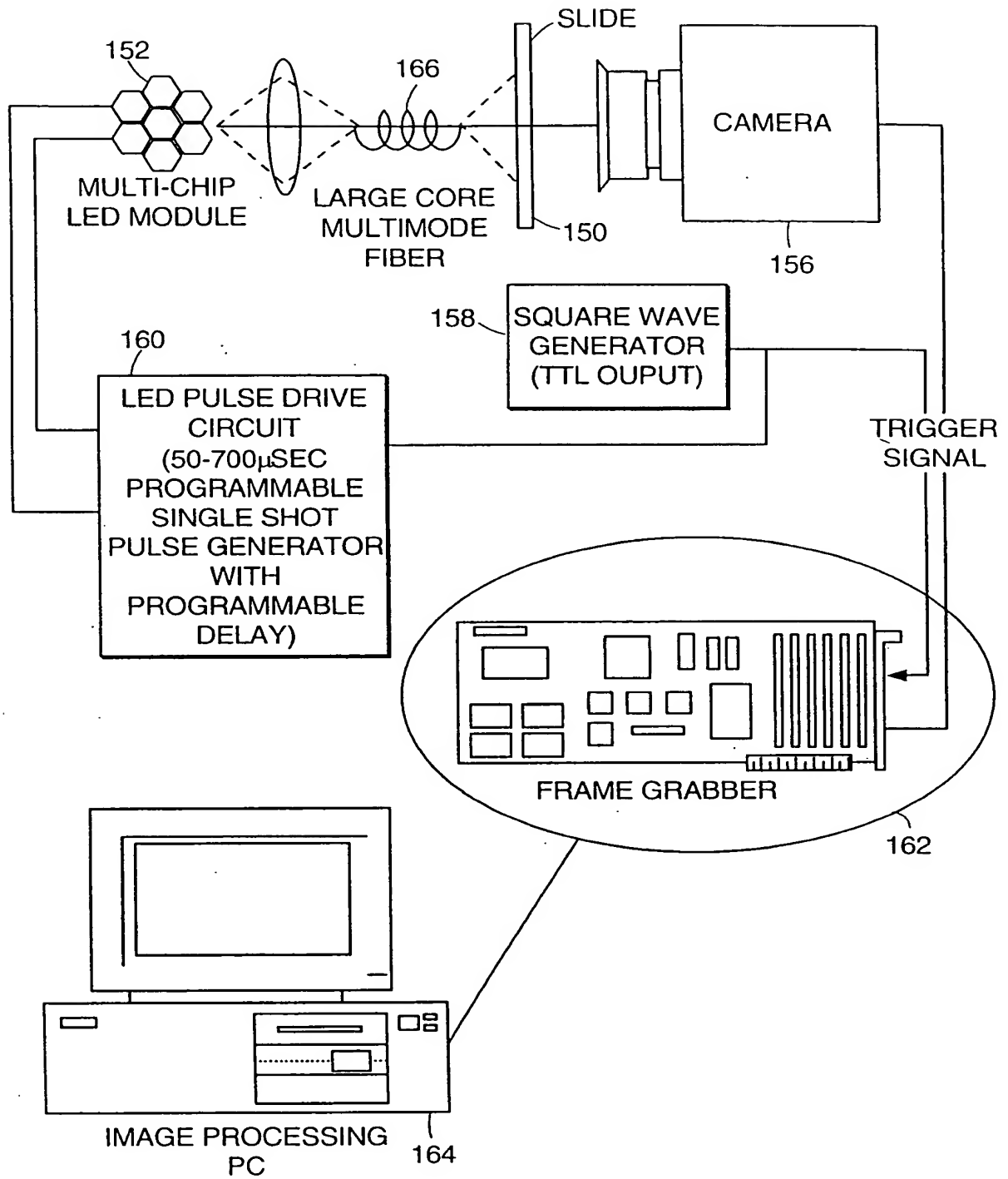
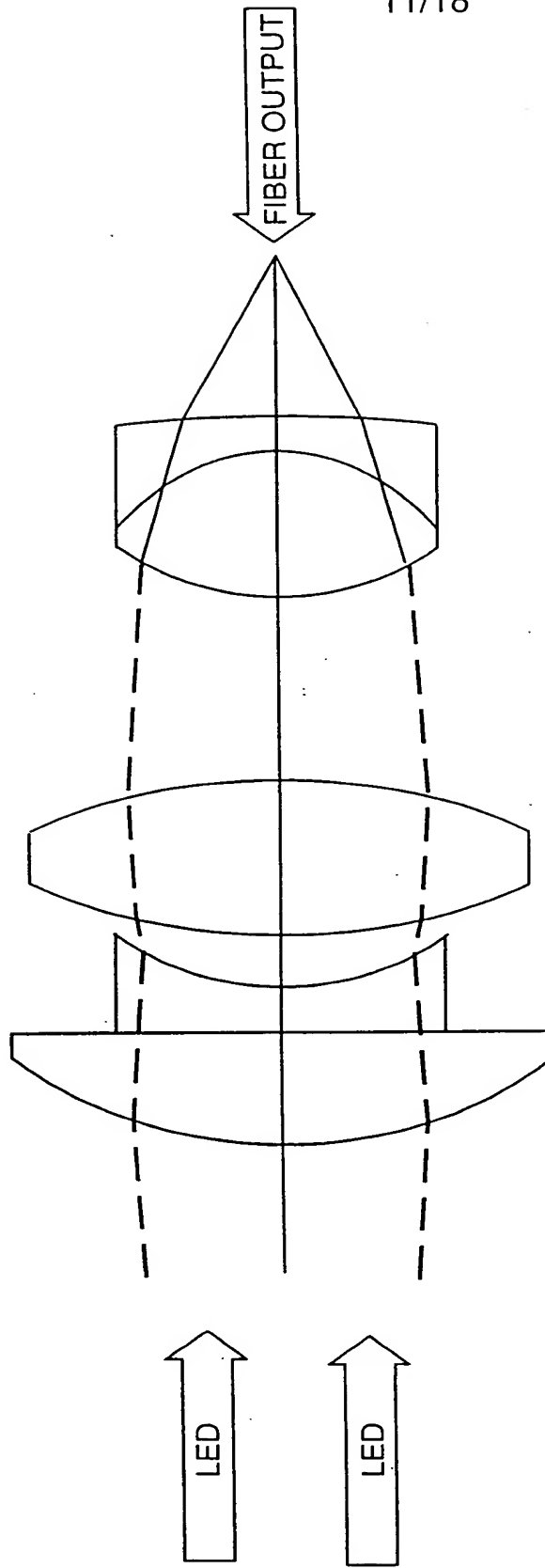


FIG. 10



LED FIBER ILLUMINATION SYSTEM

FIG. 11



OPTICS SYSTEM TO COUPLE 2 LEDs INTO SINGLE FIBER

FIG. 12

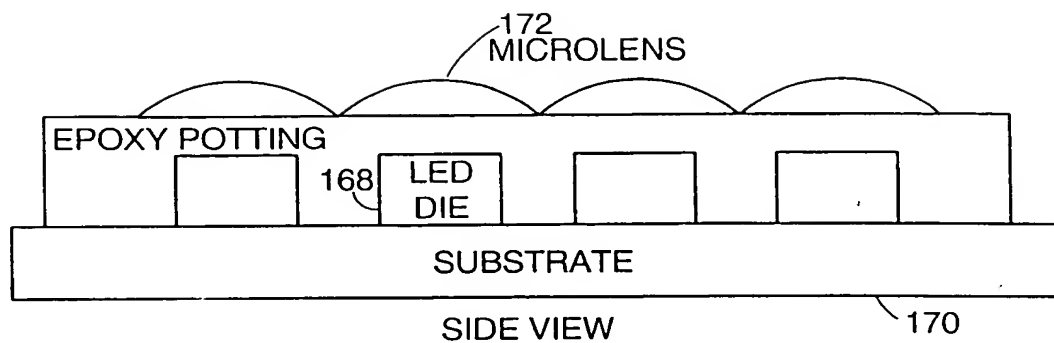
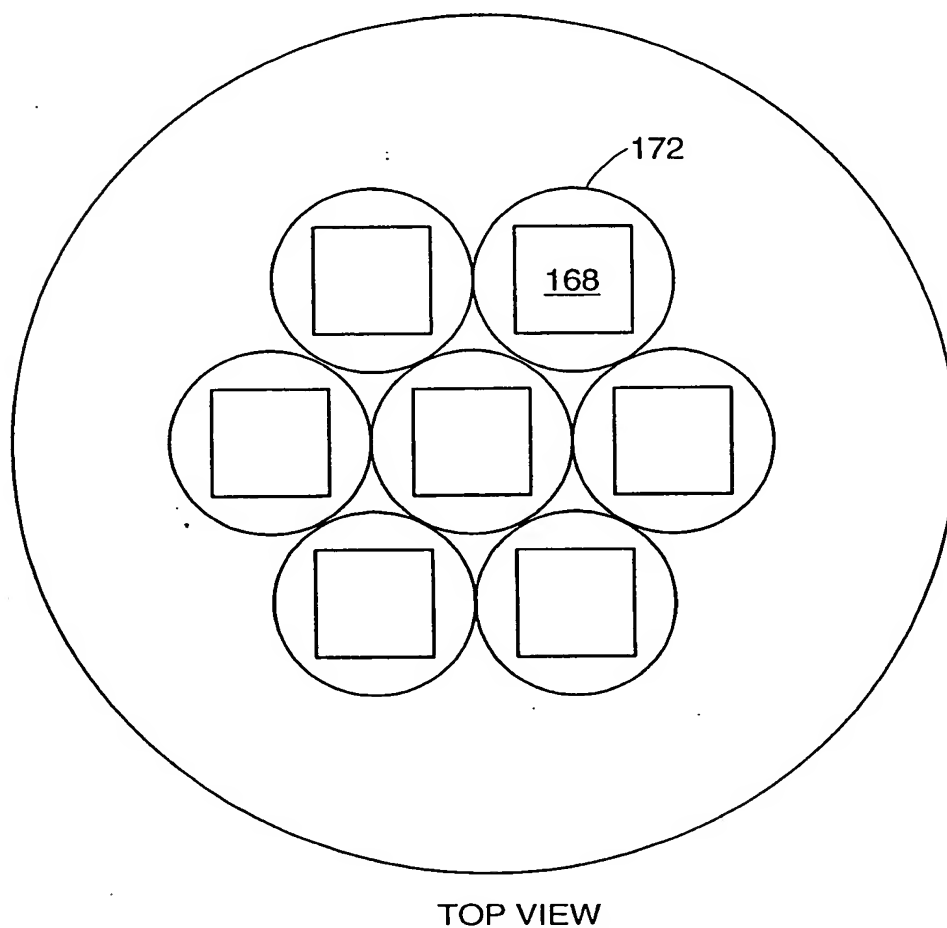


FIG. 13A



LED MULTICHIP MODULE WITH MICROLENSES

FIG. 13B

XX
XXX
XX

FIG. 14A

XOX
OXO

FIG. 14B

XOX
OXO
XOX

FIG. 14C

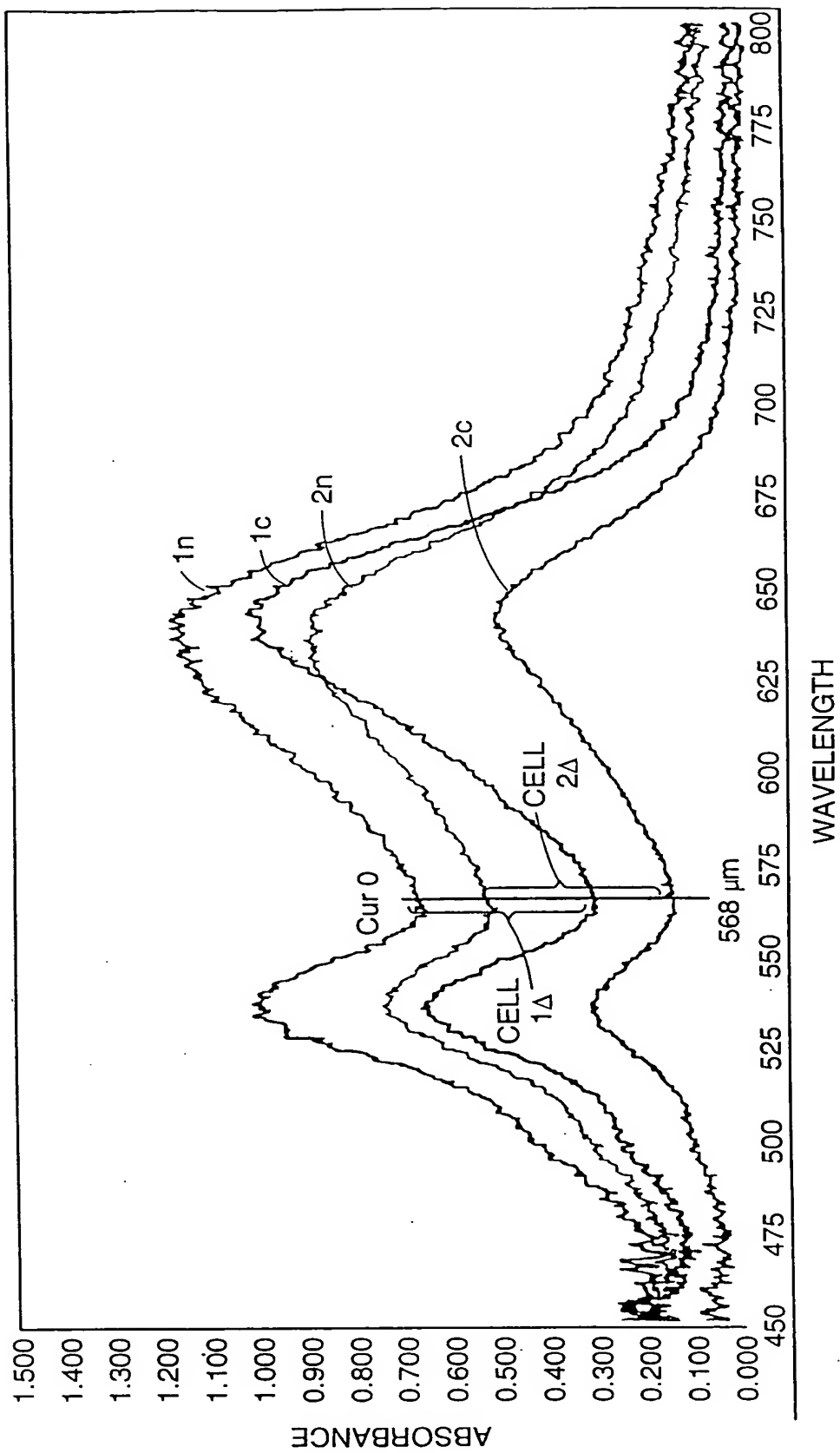


FIG. 15

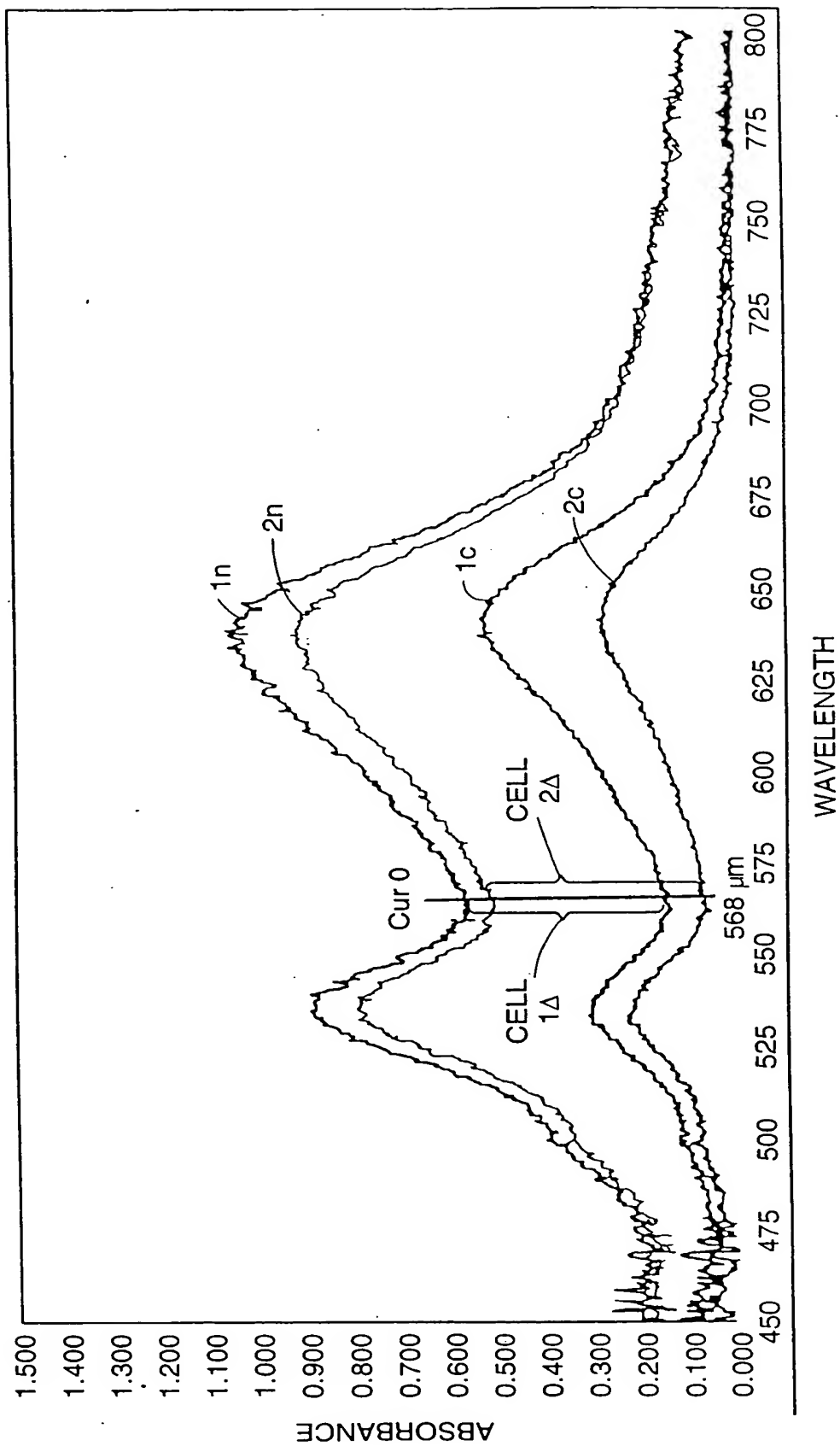
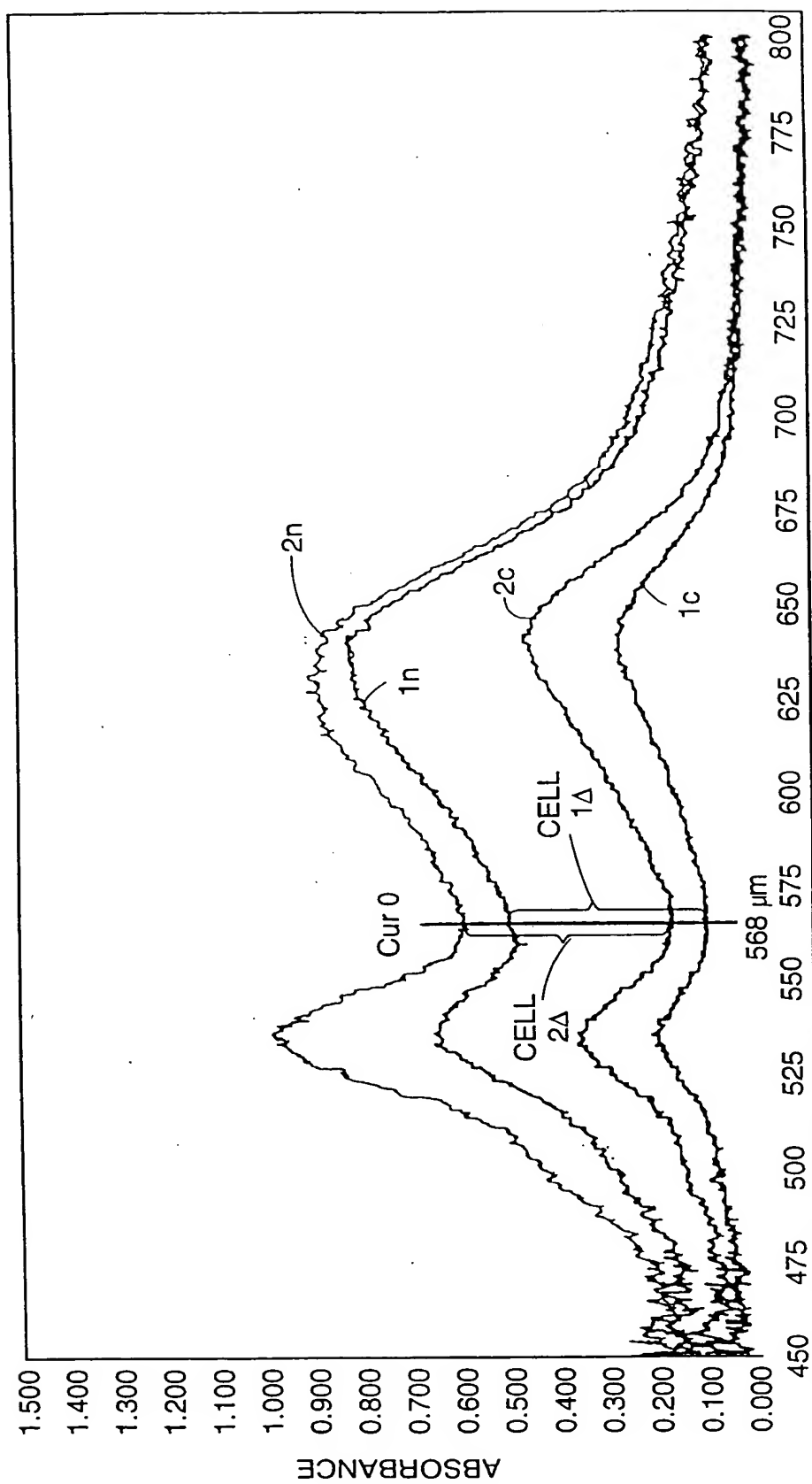


FIG. 16



WAVELENGTH

FIG. 17

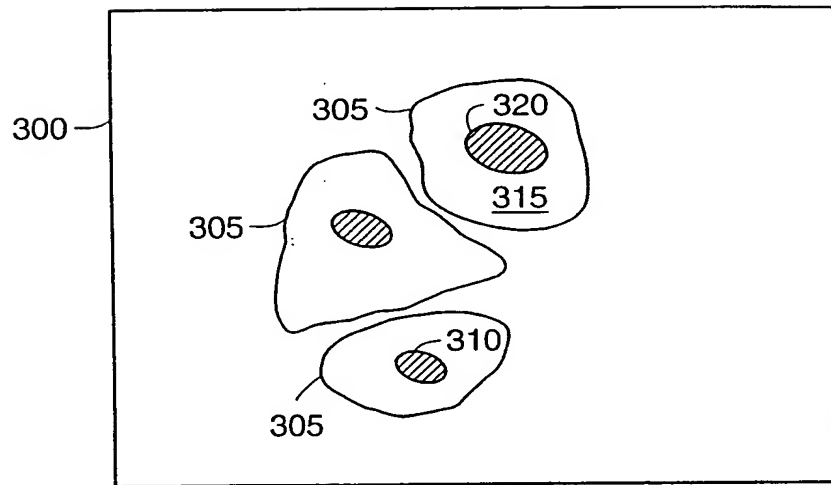


FIG. 18

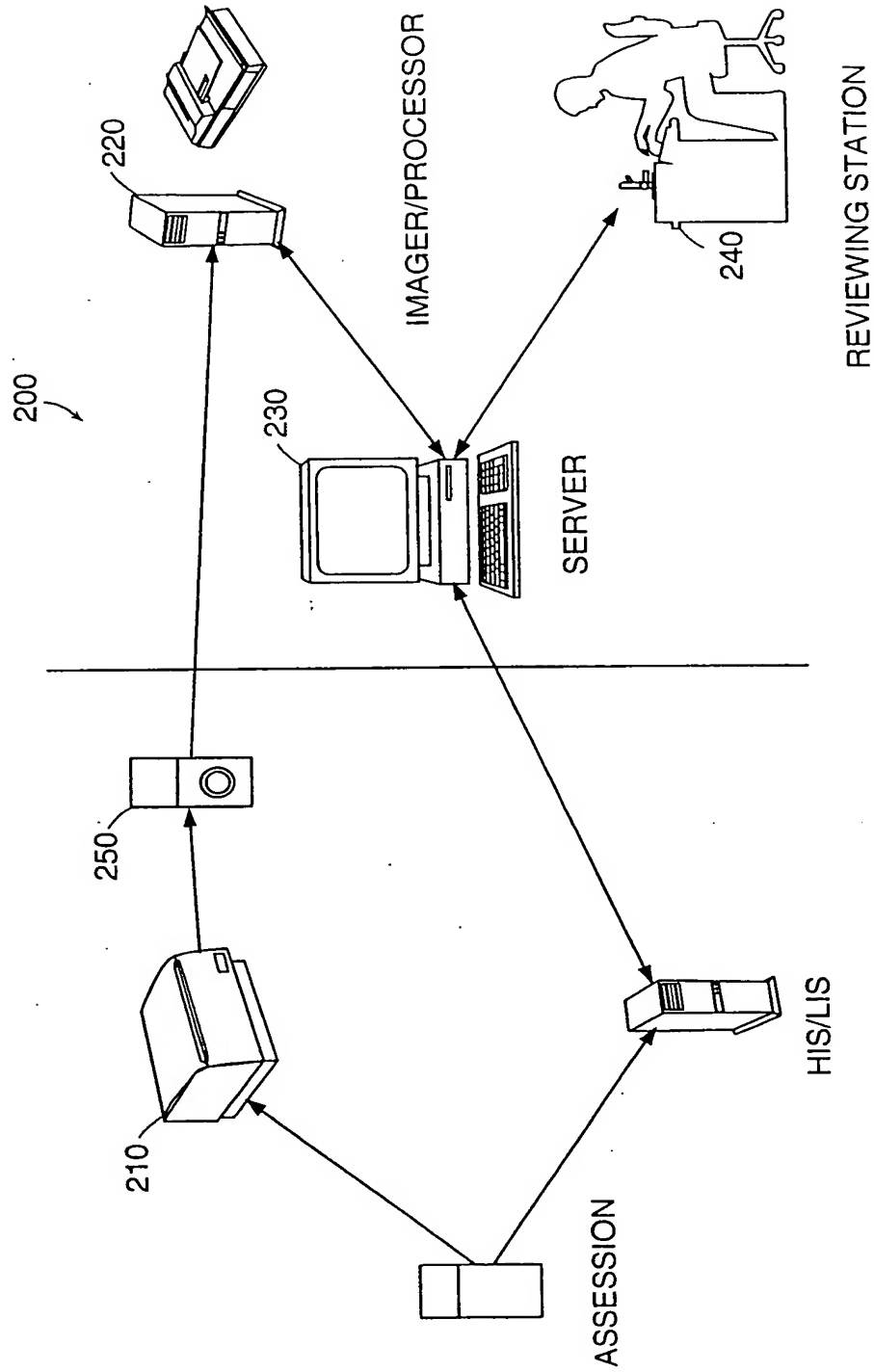


FIG. 19